

The Hong Kong University of Science and Technology
Department of Information Systems,
Business Statistics and Operations Management

Seminar Announcement

Diagnostic Services Under Congestion

by

Professor Francis de Véricourt
INSEAD

Date: Friday, 18 February 2011

Time: 11:00 am – 12:00 noon

Venue: Room 4379, ISOM Conference Room (Lift 17/18)

~~~~~ All interested are welcome ~~~~~

**Abstract:** In diagnostic services, agents typically need to weigh the benefit of running an additional test and improve the diagnosis accuracy against the cost of delaying the provision of service to others. Our paper analyzes how to dynamically manage this accuracy/congestion tradeoff. To that end, we study an elementary congested service facing an arriving stream of customers. The diagnostic process consists of a search problem in which the agent conducts a sequence of imperfect tests to determine whether a customer is of a given type. Our analysis yields counter-intuitive insights into managing diagnostic services. First, we find that the maximum number of customers allowed in the system should initially increase with the number of performed tests. This result is in sharp contrast with the established literature on value/congestion tradeoffs, which consistently asserts that congestion levels should decrease with service times. In our diagnosis system, only after the agent has run enough tests without identifying the customer type should the level of congestion decrease. This non-monotonic structure disappears when the base rate of the searched type is below a simple critical fraction, which captures the value of rightly identifying the customer type. Second, we find that the agent should sometimes diagnose the customer with the searched type, even when all tests are negative. This surprising result disappears when controlling for congestion, i.e. in a single diagnostic task.

**Bio:** Francis de Véricourt is an Associate Professor of Technology and Operations Management at INSEAD since 2010. Before joining INSEAD, he was the Associate Dean of R&D at the European School of Management and Technology in Berlin, Germany. He also held academic appointments at Duke University's Fuqua School of Business and was a visiting researcher at the Massachusetts Institute of Technology (M.I.T).

Francis' research is in operations excellence with overlap to managerial decision-making. His recent research focus is on health care and sustainability. He regularly publishes in Management Science, Operations Research, and other academic journals. He is also on the editorial boards of Operations Research and IIE Transaction.

Francis won the Best Teaching Award for the ESMT MBA in 2008 and has extensive experience in executive education.